IN THE CLAIMS:

1. (Withdrawn—currently amended) A method of producing a plurality of fused aggregates forming a desired three-dimensional structure, the method comprising: depositing a layer of a matrix on a substrate; embedding a plurality of cell aggregates, each comprising a plurality of cells, in the layer of the matrix **to form a three-dimensional layered structure of claim 52**, the aggregates being arranged in a non-random predetermined pattern, wherein the cell aggregates have predetermined positions in the pattern; allowing at least one aggregate of said plurality of cell aggregates to fuse with at least one other aggregate of the plurality of cell aggregates to form the desired structure; and separating the structure from the matrix.

2. (Withdrawn) The method of claim 1 wherein the layer of the matrix constitutes a first layer, the plurality of cell aggregates constitutes a first plurality of cell aggregates, and the predetermined pattern constitutes a first predetermined pattern, the method further comprising the steps of: depositing a second layer of the matrix on the first layer; and embedding a second plurality of cell aggregates in the second layer, the second plurality of cell aggregates comprising a plurality of cells, the second plurality of cell aggregates being arranged in a second predetermined pattern, and allowing at least one cell aggregate in the first plurality of cell aggregates to fuse with at least one cell aggregate in the second plurality of cell aggregates.

3. (Withdrawn) The method of claim 2 wherein the first and second predetermined patterns are substantially the same, and wherein the second plurality of cell aggregates is embedded in the second layer of the matrix in registration with the first plurality of cell aggregates.

4. (Withdrawn) The method of claim 2 wherein the desired structure is a tube, the first and second predetermined patterns are both circular in shape, and the second plurality of cell aggregates is embedded in the second layer of the matrix in registration with the first plurality of cell aggregates.

5. (Withdrawn) The method of claim 1 wherein the thickness of the layer of the matrix is about equal to the average diameter of the plurality of cell aggregates.

6. (Withdrawn) The method of claim 1 wherein the cell aggregates are substantially spherical.

7. (Withdrawn) The method of claim 1 wherein the cell aggregates are substantially uniform in size.

8. (Withdrawn) The method of claim 1 wherein the cell aggregates have an average size between about 100 and about 600 microns.

9. (Withdrawn) The method of claim 8 wherein no more than about 10% percent of the cell aggregates deviate from said average size by more than 5%.

10. (Canceled)

11. (Withdrawn) The method of claim 1 wherein the cell aggregates consist essentially of cells of a single type.

12. (Withdrawn—currently amended) The method of claim 1 wherein at least one of the cell aggregates comprises a plurality of **living** cells of a first type and a plurality of **living** cells of a second type that is different from the first type.

13. (Withdrawn) The method of claim 12 wherein said at least one cell aggregate comprises a mixture of said cells of the first type and said cells of the second type and the method further comprises the step of allowing at least some of the cells of the first type to segregate from at least some of the cells of the second type.

14. (Withdrawn—currently amended) The method of claim **12** ~~13~~ wherein the cells of the first type are epithelial cells and the cells of the second type are connective tissue-forming cells.

15. (Withdrawn) The method of claim 1 wherein the predetermined pattern comprises a ring.

16. (Withdrawn) The method of claim 1 wherein the matrix comprises a gel.

17. (Withdrawn) The method of claim 1 wherein said plurality of cell aggregates includes at least one cell aggregate consisting essentially of cells of a first type and at least one other cell aggregate consisting essentially of cells of a second type different from the first type.

Claims 18.–51. (Canceled)

52. (Previously presented) A three-dimensional layered structure comprising: at least one layer of a matrix; and a plurality of cell aggregates, each cell aggregate comprising a plurality of living cells; wherein the cell aggregates are embedded in the at least one layer of matrix in a non-random predetermined pattern, the cell aggregates having predetermined positions in the pattern.

53. (Previously presented) The structure of claim 52, wherein the cell aggregates are substantially uniform in size and shape.

54. (Previously presented)The structure of claim 52, wherein the cell aggregates are cylindrical.

55. (Previously presented) The structure of claim 54, wherein the cylindrical cell aggregates are from about 100 microns to about 600 microns in cross-sectional diameter.

56. (Previously presented) The structure of claim 52, wherein the cell aggregates are substantially spherical.

57. (Previously presented) The structure of claim 56, wherein the substantially spherical cell aggregates are between about 100 and about 600 microns in diameter.

58. (Previously presented) The structure of claim 52, wherein each cell aggregate comprises a plurality of living cells of a single cell type.

59. (Currently amended) The structure of claim 52, wherein **at least one of the ~~each~~** cell aggregate**s** comprises a plurality of living cells of a first ~~**cell**~~ type and a plurality of living cells of a second ~~**cell**~~ type, the second ~~**cell**~~ type being different from the first ~~**cell**~~ type.

60. (Currently amended) The structure of claim 52, wherein the plurality of cell aggregates **includes at least one cell aggregate consisting essentially of cells of ~~comprises a plurality of cell aggregates of~~** a first ~~**cell**~~ type and a**t least one other cell aggregate consisting essentially of cells ~~plurality of cell aggregates~~** of a second ~~**cell**~~ type, the second ~~**cell**~~ type being different from the first ~~**cell**~~ type.

61. (Previously presented) The structure of claim 52, wherein the at least one layer of matrix is biocompatible and about 100 microns to about 600 microns thick.

62. (Previously presented) The structure of claim 52, wherein the at least one layer of matrix is biocompatible and selected from the group consisting of thermo-reversible gels, photo-sensitive gels, pH-sensitive gels, cell type specific gels, and combinations thereof.

63. (Previously presented) The structure of claim 52, wherein the at least one layer of matrix is biocompatible and comprises at least two different types of biocompatible matrices.

64. (Previously presented) The structure of claim 52 comprising: a first layer of matrix; and a second layer of matrix deposited on the first layer; wherein the first layer and second layer of matrix are biocompatible; wherein the cell aggregates are embedded in the first layer and in the second layer in a predetermined pattern.

65. (Previously presented) The structure of claim 64 further comprising at least one additional layer of matrix deposited on the second layer, wherein the at least one additional layer of matrix is biocompatible, wherein the cell aggregates are embedded in the first layer, the second layer, and the at least one additional layer in a predetermined pattern.

66. (Previously presented) The structure of claim 64, wherein the first layer comprises a type of biocompatible matrix that is different from the type of biocompatible matrix in the second layer.

Claims 67–84. (Canceled)

85. (new) The structure of claim 59, wherein the cells of the first type are smooth muscle cells and the cells of the second type are endothelial cells.

86. (new) The structure of claim 60, wherein the cells of the first type are smooth muscle cells and the cells of the second type are endothelial cells.

87. (Withdrawn—new) The method of claim 12, wherein the cells of the first type are smooth muscle cells and the cells of the second type are endothelial cells.

88. (Withdrawn—new) The method of claim 17, wherein the cells of the first type are smooth muscle cells and the cells of the second type are endothelial cells.